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and draws the conclusion that for $x = a$, y has a definite and also an indeterminate value. The object of this note is to show that we are not warranted in drawing such a conclusion.

When we clear (1) of fractions by multiplying both sides by $x - a$ and consider $(x - a)/(x - a)$ as having the value unity, we are at liberty to do so only upon condition that $x \neq a$.

Geometrically it is clear that when $x = a$ we are not warranted in drawing the conclusion that $y = 2a$ and $y = 0/0$. For, let x take a series of values from $x = a - d$ to $x = a + d$, ($d > 0$). When $x \neq a$, $y = x + a$. Hence the co-ordinates of a point on the curve (1) satisfy the equation $y = x + a$, when $x \neq a$; but when $x = a$ we are not warranted in drawing the conclusion that y is necessarily equal to $2a$.

If we trace the locus of (1) from $x = a - d$ to $x = a + d$, we follow the straight line $y = x + a$ until we come to the point where $x = a$, then expand upward and downward to infinity vertically. As we pass on through $x = a$ the locus again follows the curve $y = x + a$. When $x = a$ in (1) we get the result that y is always genuinely indeterminate and does not take a definite value.

Note. The above discussion is published, as was Mr. Nicholson's, because of the interest which the subject possesses for many instructors.

In general, we take for granted that a function exists only where it has been defined. Consequently it seems to us that no amount of argument can get anywhere concerning the function in question for $x = a$ until the function has been defined for $x = a$, and when the function has been defined for $x = a$ the cause for argument disappears.

Neither Mr. Nicholson nor Mr. Tripp defines the function in question for $x = a$. In equation (1) of either paper, $y = x + a$ for $x \neq a$ and is not defined for $x = a$. Mr. Nicholson says (1) consists of two loci, but forgets that he introduces one of them, $x - a = 0$, when he multiplies both members of (1) by $x - a$.—U. G. M.

NOTES AND NEWS.

EDITED BY D. A. ROTHROCK, Indiana University, Bloomington, Ind.

After April 20, 1917, all communications to the Secretary, Professor W. D. CAIRNS, should be addressed to 55 East Lorain Street, Oberlin, Ohio, whither he is returning after a sojourn of seven months at the University of Chicago.

Dr. V. M. SLIPHER, for a number of years chief assistant at the Lowell Observatory, Flagstaff, Arizona, has been promoted to the directorship of the observatory, succeeding the late Percival Lowell.

Dr. EDWARD KIRCHER, Benjamin Peirce instructor in mathematics at Harvard University for the past two years, has accepted an instructorship in mathematics at the University of Minnesota.

CHARLES J. WHITE, emeritus professor of mathematics at Harvard University, died on February 12, at the age of seventy-eight years.

CHARLES A. PITKIN, professor of mathematics and physics at Thayer Academy, South Braintree, Mass., since 1877, died on November 7, at the age of sixty-three years.

Professor FLORIAN CAJORI, president of the Mathematical Association of America, has a review of Macfarlane's "Lectures on Ten British Mathematicians of the Nineteenth Century" in *Science*, January 26.

According to press dispatches from Berlin, the Prussian Minister of Education has announced to the Budget Committee of the Reichstag that 10,950 public-school teachers have fallen during the present European war and that their places have been taken by women.

Professor L. E. DICKSON, of the University of Chicago, has retired from the editorial committee of the *Transactions of the American Mathematical Society*, his unexpired term being filled by the selection of Professor L. P. EISENHART. Professors G. A. BLISS and E. B. WILSON, associate editors of the *Transactions*, have also retired, and have been succeeded by Professors C. N. MOORE and F. R. SHARPE.

The prize awards by the Paris Academy of Science, 1916, included 2,000 francs to Professor N. E. NÖRLUND, of the University of Lund, for his work on linear difference equations. The Paris Academy also announces the following mathematical prizes for 1918: (1) The Poncelet prize of 2,000 francs, to the author of the work most useful to the progress of pure mathematics; (2) The Francoeur prize of 1,000 francs, for discoveries or works useful to the progress of pure or applied mathematics.

The Texas Mathematics Teachers' Bulletin, Vol. 2, No. 2, appeared on December 15, 1916. This periodical is edited by Adjunct Professor J. W. CALHOUN, and Associate Professor C. D. RICE, of the University of Texas. It is published as a *Bulletin* of the University of Texas, and is open to the teachers of mathematics in Texas for the expression of their views, the editors assuming no responsibility for statements of facts or opinions in articles not written by them. The contents of the present number will show the nature of the subjects discussed. The following subjects are treated: "The geometry original," by J. G. DUNLAP; "The mathematics of investment," by E. L. DODD; "Literal arithmetic," by C. D. RICE; "On postulational systems," A. A. BENNETT.

The British Mathematical Association held its annual meeting at London on January 5, at which the following papers were presented: "The school syllabus in geometry," by T. P. NUNN; "Some of the work of the teaching committee," by A. W. SIDDONS; "Technical education and its relations to literature and science," by A. N. WHITEHEAD; "An accuracy test set in some public schools," by A. W. SIDDONS; "The place of mathematics in education reconstruction," by P. ABBOTT.

Regular meetings of the Edinburgh Mathematical Society were held on December 8 and January 12 at which the following papers were read: "On a class of continued fractions" and "A method of solving algebraic equations," by L. R. FORD; "On certain determinants of Cayley and Sylvester," by E. T. WHITTAKER; "An addition to the slide rule," by E. M. HORSBURGH; "The apolar locus of two tetrads of points," by W. P. MILNE.

At the January meeting of the London Mathematical Society the following papers were presented: "Asymptotic formulæ in combinatory analysis," by G. H. HARDY and S. RAMANUJAN; "The singular solutions of ordinary differential equations of the first order," by M. J. M. HILL; "The nature of a moving electric charge and its lines of electric force," by H. BATEMAN; "The expansion of the variables of a hypergeometric equation in terms of the ratio of two solutions," by L. J. ROGERS; "A problem in the theory of diffraction," by H. J. PRIESTLEY.

The February number of the *Proceedings* of the National Academy of Sciences contains the following mathematical papers: "Natural and isogonal families of curves on a surface," by JOSEPH LIPKA; "Some problems of Diophantine approximation," by G. H. HARDY and J. E. LITTLEWOOD; "A note on the fitting of parabolas," by J. R. MINER.

With this issue of the MONTHLY is completed a synopsis of mathematical courses offered in the coming summer sessions of the various colleges and universities of this country. Eighteen programs have been received in response to the request in the February number of the MONTHLY and the circular letter issued in January. The following summer announcements have been received since the copy for the March number of the MONTHLY was made up:

UNIVERSITY OF CALIFORNIA. Summer session, June 25–August 4. By Professor T. M. PUTNAM: Functions of a complex variable; Seminar for graduate students.—By Professor E. R. HEDRICK (University of Missouri): Functions of a real variable; A survey of elementary mathematics.—By Professor B. M. WOODS: Mathematics of investment; Integral calculus.—By Dr. H. N. WRIGHT: Synthetic projective geometry; Differential geometry. The elementary courses in freshman mathematics will be given.

HARVARD UNIVERSITY. Summer session, July 2–August 11. By Professor M. BÔCHER: Plane analytic geometry, five hours.—By Professor D. JACKSON: Logarithms and trigonometry, five hours.

UNIVERSITY OF KENTUCKY. Summer session, June 11–July 25. By Professor P. P. BOYD: Integral calculus, six hours; Analytics, six hours; College algebra, six hours.—By Professor J. M. DAVIS: Differential calculus, six hours; Trigonometry, six hours. Courses are offered in high-school algebra and geometry.

THE UNIVERSITY OF MINNESOTA. Summer session, June 18–July 28. By Professor G. N. BAUER: Trigonometry, eight hours; Fundamental concepts of secondary mathematics, four hours.—By Professor W. H. KIRCHNER: Solid geometry, eight hours; Descriptive geometry, eight hours.—By Professor W. F. HOLMAN: Integral calculus, twelve hours.—By Professor W. D. REEVE: Teachers' course, eight hours; Algebra, eight hours.—By Professor H. L. SLOBIN: Theory of equations, eight hours; Differential calculus, eight hours.—By Mr. R. M. BARTON: Analytics, eight hours; Algebra, eight hours.

UNIVERSITY OF MISSOURI. Summer session, June 7–August 3. By Professor W. D. A. WESTFALL: Integral calculus, five hours; Calculus of variations, three hours; Synoptic course, three hours.—By Professor W. D. CAIRNS (Oberlin College): Analytic geometry, five hours; Elementary calculus, five hours; Advanced calculus, three hours.—By Professor L. INGOLD: College algebra, five hours; Trigonometry, five hours; Teaching of mathematics, three hours.

UNIVERSITY OF SOUTHERN CALIFORNIA. Summer session, July 2–August 11. By Professor PAUL ARNOLD: Teachers' course, five hours; Integral calculus, five hours.—By Professor H. C. WILLETT: Analytic geometry, five hours; Trigonometry, five hours.

THE UNIVERSITY OF TENNESSEE. Summer session, June 19–July 27. By Professor H. E. BUCHANAN: History of mathematics; Trigonometry; Teachers' course in algebra.—By Professor J. B. HAMILTON: College algebra; Solid geometry; Plane geometry; Elementary algebra.

UNIVERSITY OF WASHINGTON. Summer session, June 18–July 31. By Professor R. E. MORITZ: Elementary graphs, five hours; Mathematics of investment, five hours; Definite integrals, five hours.—By Professor A. F. CARPENTER: Trigonometry, five hours; Mathematics in the high schools, five hours.—By Professor E. T. BELL: Teachers' course in algebra, five hours; Theory of equations, five hours.

KIRKSVILLE (MO.) STATE NORMAL SCHOOL. Summer Session, May 30–Aug. 2. By Professor WM. H. ZEIGEL: Integral Calculus and Surveying.—By Professor BYRON COSBY: Teaching of Elementary Mathematics; Trigonometry.—By Professor G. H. JAMISON: College Algebra; Analytic Geometry.—By Professor CHAS. A. EPPERSON: Teaching of Secondary Mathematics; Theory of Equations.

Various members of the Association are announced as special instructors for the summer sessions in institutions other than their own. Among these are Professors W. D. CAIRNS, at the University of Missouri, E. R. HEDRICK, at the University of California, D. N. LEHMER and G. D. BIRKHOFF, at the University of Chicago, A. COHEN and B. F. FINKEL, at the University of Colorado.